APPENDIX II

ALL PENDING CLAIMS WITH AMENDMENTS EFFECTED THEREIN

1. (Twice Amended) Affinity sensor for detecting specific binding events in response to a sample medium, comprising a carrier substrate provided with at least two electrodes and having a predetermined area, said electrodes being equidistantly spaced apart from each other and engagingly bordering said area on opposing sides, at least said area being adapted for receiving immobilized specific binding partners for coupling complementarily associated binding partners directly or via further specific binding molecules, said area being accessible said complementarily associated binding partners provided in a sample medium and having a minimum width adapted for capture of at least one of said complementarily associated binding partners provided with one electrically conductive particle within said area in such a way as to allow for formation of a respective tunnel contact junction between the particle and the electrodes.

2.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 1, wherein said width is under 800 nm.

3.(Twice Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 1, wherein the immobilized specific binding partners cover said area with a thickness which permits tunnel effects.

4.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 1, wherein the electrodes are each two micro-electrodes arranged in a pair, the electrodes being connected to an amplifier circuit with an associated measuring and evaluating unit so that an electric current flow across the area can be detected when there is a voltage applied across the electrodes.

5.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 4, wherein the electrodes are part of the amplifier circuit and project from out of the latter.

6.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 5, wherein the amplifier circuit is a component of a microchip.

7.(Twice Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 1, wherein the electrodes are comb-like structures

opposingly meshed, and said predetermined area includes affinity areas at least between respective opposing ones of said electrodes.

8.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 7, wherein the comb-like electrodes and the affinity areas are arranged on a common chip surface.

9.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 8, wherein the chip surface is formed by a silicon wafer.

10.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 8, wherein the chip surface is formed by a glass target.

11.(Twice Amended)Affinity sensor for detecting specific molecular binding events as claimed claim 7, wherein the comb-like electrodes are arranged in geometrical symmetry to interdigital structures and said affinity areas are arranged in a matrix, the electrodes are separated from each other at intersections by an insulating layer arranged between the electrodes.

12.(Twice Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 7, wherein said electrodes are micro-electrode and a length of the micro-electrodes is 0.1 mm, the width of the area is 0.1 μm and its effective height is 0.02 μm as well as the affinity areas is at a 1:10 ratio relative to the chip surface.

13.(Amended)Affinity sensor for detecting specific molecular binding events as claim 7, wherein in addition to the affinity areas at least one reference area is provided which carries inactive binding partner for a reference measurement instead of the specific binding partners.

14.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 7, wherein the occupation density of the specific binding partners on the individual affinity areas is different.

15.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 7, wherein the individual affinity areas carry different specific binding partners.

16.(Twice Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 1, 13, 14 or 15, wherein a plurality of reference areas is provided being occupied with different inactive binding partners.

17.(Twice Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 1, wherein the specific binding partners enter into chemical coordination.

18.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 1, wherein the specific binding partners are bioactive or biomimetic molecules.

19.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 17, wherein the specific binding partners are nucleic acids.

20.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 17, wherein the specific binding partners are proteins.

21.(Amended) Affinity sensor for detecting specific molecular binding events as claimed in claim 17, wherein the specific binding partners are saccharides.

22.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 1, wherein the conductive particles are of sizes in the range of 0.1 μm to 5 μm.

23.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 1, wherein the conductive particles are of sizes in the nanometer range.

24.(Amended)Affinity sensor for detecting specific molecular binding events as claimed in claim 1, wherein the conductive particles consist of metal-cluster compounds.